POLAR VERSUS EQUATORIAL CLIMATOLOGY.

The great international campaign for the study of the meteorology and magnetism of the arctic and antarctic regions which was prosecuted by many nations simultaneously and, according to a well-arranged programme during the years 1882–'83, resulted in the publication of a noble series of volumes containing the results, and in a few cases a preliminary discussion of the general bearing of the results on some of the problems of terrestrial physics. By general agreement no one was expected to give a general résumé of the subject until all the observational data had been fully published, and as this has not been entirely accomplished one need not wonder that this great storehouse of data has not yet been exhaustively utilized. For a century to come these volumes of observations will be quoted as we advance further in our knowledge of the secrets of nature. The latest contribution to the original data has lately been published as the third volume of the records of the polar expedition sent out by Finland. This expedition occupied a station at Sodankyla north of Finland (N. 67° 27′, E. 26° 36′) as also a temporary station, Kultala (N. 68° 30′, E. 26° 46′); observations were also made in cooperation with the station Kautokino (N. 69°, E. 23°) in the province of Finmark, Norway, and occupied by the Norwegian student of auroras, the late M. Tromholt. Among other specialties, observations were also made upon the electric currents and the auroral flames visible to the naked eye in the neighborhood of the mountain Oratunturi (N. 67° 21′, E. 27° 17′).

The three volumes that contain the work done by the Finnish Expedition are due principally to Prof. Selim Lemstrom, Chief of the Expedition and Professor of Physics at the University of Helsingfors, and Dr. Ernest Biese, Chief of the station of Sodankyla and Director of the Central Meteorological Institute at Helsingfors. These, and the fifty or more corresponding volumes published by other European countries, together with the handsome volumes published by the United States Government for the polar stations occupied by General Greely and Captain Ray, stand as monuments to the conviction that formerly prevailed among scientists, to the effect that the meteorological and magnetic phenomena of the globe depends to a large extent upon what is going on in the polar regions.

On the other hand it is clear that the meteorology of the temperate zones depends to an equal extent upon what is going on in the equatorial regions and there is an increasing need of meteorogical explorations on the ocean and meteorological stations on the land throughout the torrid zone. A hundred years ago, the explorations of Humboldt in this zone, awakened an enthusiasm that should never be allowed to die out. During the past fifty years, the Spanish, Portuguese, French, and Dutch colonies throughout these zones have contributed, according to their ability, to climatological investigations; but now that German, English, and American energies have been awakened, we may hope that still more will be accomplished within the Tropics.

ROCKALL AS A METEOROLOGICAL STATION.

The Scottish Geographical Magazine for August, 1898, contains an article by Mr. Miller Christy, historical and descriptive of the famous rock in the North Atlantic Ocean known as Rockall, but in former centuries more commonly Rocol, Rochol, or Rokol. The island is but a rocky pyramid standing solitary and alone at N. 57° 36′, W. 13° 42′; it has a diameter of about 80 feet and the summit is about 70 feet above the surface of the water. It is about 470 miles from Iceland and 160 from St. Kilda, in the Outer Hebrides, and was probably known to the merchants of Bristol, who, from the earliest times, carried on a trade in dried fish with Iceland. Mr. Christy's article summarizes all that is known as to the nature, position, history, and modern scientific exploration of this interesting speck of oceanic land and the reefs and fishing banks immediately adjoining it. To the meteorologist a particular interest attaches to this rock. Several explorers have landed upon it and thus demonstrated the possibility of occupying it as a permanent meteorological station, at least during a portion of the year. But the fact that in winter time the waves undoubtedly wash over its summit may well cause one to doubt whether the maintenance of a lighthouse or an observing station will ever be a practical possibility. On the other hand, Mr. Christy suggests that it would be more feasible to moor a light-ship on some portion of Rockall Bank and utilize that as a meteorological station.

The desirability of connecting this station with the mainland by a submarine telegraph cable has been indorsed by Dr. R. H. Scott, F. R. S., secretary of the Meteorological Council and superintendent of the meteorological office at London, who has said: "If a station on Rockall could possibly be established and maintained, its value to weather telegraphy would be incalculable."

Mr. Christy estimates the cost of the submarine cable at 35,000 or 40,000 pounds sterling; the annual expense of maintenance of the light-ship would undoubtedly be large, but still feasible, and in the end economical, considering its value to the British marine.

It would seem that the character of the stone of which this rock is composed is of a new and interesting type, entirely different from that found anywhere else on the globe; Professor Hull has given it the distinctive characteristic name, rockallite, and he suggests that the nearest resemblance to it is found among the Post-Silurian dykes near Christiania, and it may be that in Rockall we have a similar intrusive mass of the same period that has escaped destruction by denudation. It is plausible that as lately as two or three centuries ago the main rock that is now still standing was surrounded by a small sand dyke and that adjacent reefs had a greater exposure than now, and that one or more additional islets then existed. Of course, the rock is a breeding place for rare birds, and Mr. Christy's article will doubtless stimulate some naturalist to explore this region more thoroughly. He says:

> It is perhaps, improbable, after the failure of the recent expedition to effect a landing, that another properly equipped expedition will be undertaken on purpose; but there are surely plenty of British and American yachtsmen, owning stout, sea-going steam yachts, who would be glad to have a definite and useful object for a short ten days' cruise, accompanied by some scientific friend, during next summer. To any such, a trip to Rockall may be recommended. Any such expedition should not be undertaken earlier than the middle of May or later than the beginning of July, between which dates the birds frequenting the rock would be found breeding, and there would be a fair probability of meeting with fine weather. It is true that there would always be a possibility that the weather at the time of the visit might not permit of a landing being effected, but a few days' dredging on the bank would certainly afford results of much interest to students of marine zoology; and, even if nothing of scientific interest were accomplished, a cruize would have been enjoyed.

INTERNATIONAL METEOROLOGICAL SYMBOLS.

In publishing scientific works that are likely to be used by students of all nations it is desirable to avoid the use of words from any one specific language, and to employ symbols that shall be universally acceptable and intelligible. The progress of science has, in general, been greatly favored by the agreement to adopt uniform notations and expressions. Mathematicians, musicians, botanists, chemists, architects and many others have their specific symbols and terms, the use of which favors the clear expression and quick comprehension of the idea that has to be conveyed. A set of special meteorological symbols was devised by the Permanent Committee appointed by the International Meteorological Con-